

Appl'n. No. 09/752,557
Response dated November 5, 2005
Reply to Office Action of July, 5, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (original): A device for performing surgery or therapeutic interventions on a patient, comprising:

- a first curvature sensor configured to be placed on a patient, the first curvature sensor providing an output;
- an attachment fixture coupled to the first curvature sensor; and
- a computer receiving the output of the curvature sensor.

Claim 2 (original): The device of claim 1 wherein the first curvature sensor further comprises a plurality of fiducials capable of being detected by a medical imaging system.

Claim 3 (original): The device of claim 1, further comprising:

- a second curvature sensor providing an output to the computer, the second curvature sensor having a first end and a second end and capable of being coupled to the attachment fixture at the first end; and
- a tool connector coupled to the second end of the second curvature sensor.

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Claim 4 (original): The device of claim 3, further comprising a second attachment fixture capable of being positioned at a known location with respect to the first curvature sensor, wherein the second end of the second curvature sensor is coupled to the second attachment fixture and the tool connector is coupled to the second curvature sensor between the first end and the second end.

Claim 5 (original): The device of claim 3, further comprising a monitor for positionally displaying the tool connector with respect to the patient.

Claim 6 (original): The device of claim 3, further comprising an electronic interface device coupled to the first curvature sensor and electronically coupled to the computer.

Claim 7 (original): The device of claim 3, further comprising an optical tracking system electronically coupled to the computer and configured to positionally track the tool connector or a tool positioned in the tool connector.

Claim 8 (original): The device of claim 7, wherein the computer uses both the second curvature sensor and the optical tracking system to positionally track the tool connector or a tool positioned in the tool connector.

Claim 9 (original): The device of claim 1, wherein the computer is configured to determine an attachment fixture-centered frame of reference based on the

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output of the curvature sensor.

Claim 10 (original): The device of claim 1, wherein the first curvature sensor comprises a fiber optic curvature sensor.

Claim 11 (original): The device of claim 1, wherein the attachment fixture comprises:

at least one fiducial; and

a latching mechanism configured for attaching to the first end of the second curvature sensor.

Claim 12 (original): A device for performing surgery or therapeutic intervention on a patient, comprising:

an attachment fixture;

at least one fiducial coupled to the attachment fixture, the fiducial being capable of being detected by a medical imaging system;

a curvature sensor having a first end and a second end and capable of being coupled to the attachment fixture at the first end;

a tool connector coupled to the second end of the curvature sensor; and

a computer electronically coupled to the curvature sensor.

Claim 13 (original): A device for use in an image guided therapy or image guided surgery system, comprising:

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a curvature sensor configured to be applied to a portion of a patient, the curvature sensor being adapted to measure and provide an output of the curvature the portion of the patient; and
an attachment fixture coupled to the curvature sensor, the attachment fixture comprising a fiducial.

Claim 14 (original): The device for use in an image guided therapy or image guided surgery system according to claim 13, further comprising a plurality of fiducials coupled to the curvature sensor.

Claim 15 (original): The device for use in an image guided therapy or image guided surgery system according to claim 13, wherein the curvature sensor comprises a fiber optic curvature sensor.

Claim 16 (original): A device for generating a patient based frame of reference for an image guided therapy or image guided surgery system, comprising:
a curvature sensor configured to be applied to a portion of a patient, the curvature sensor being adapted to measure and provide an output of the curvature the portion of the patient; and
an attachment fixture coupled to the curvature sensor at a known position with respect to the curvature sensor.

Claim 17 (original): A device for generating a patient-based frame of reference for

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an image guided therapy or image guided surgery system according to claim 16, further comprising a plurality of fiducials, each fiducial of the plurality of fiducials being coupled to the curvature sensor at known inter-fiducial distances.

Claim 18 (original): A device for generating a frame of reference for an image guided therapy or image guided surgery system, comprising:

a ribbon, the ribbon being comprised of one or a combination of plastic, metal wire, metal strip, fabric, rubber, synthetic rubber, nylon, thread, glass, or paper;

a plurality of fiducials attached at known inter-fiducial distances along the ribbon; and

an attachment fixture coupled to the ribbon at a known position with respect to the plurality of fiducials.

Claim 19 – 25 (cancelled).

Claim 26 (original): A system for monitoring or enabling surgery on a patient at a distance, comprising:

a first curvature sensor configured to be placed on the patient, the first curvature sensor providing an output;

an attachment fixture attached to the first curvature sensor;

a second curvature sensor having a first end and a second end and

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capable of being coupled at the first end to the attachment fixture, the second curvature sensor providing an output;

a tool capable of being coupled to the second end of the second curvature sensor;

a computer receiving the outputs of the first curvature sensor and the second curvature sensor and adapted to provide an output of the curvature of the first curvature sensor and the position and orientation of the tool coupled to the second end of the second curvature sensor with respect to the attachment fixture; and

a communication device electronically coupled to the computer and adapted to communicate the output of the computer to a distant receiver.

Claim 27 (original): A device for monitoring the motions of a body, comprising:

a garment configured to be applied to a body, the garment comprising,

at least one curvature sensor, and

a plurality of filaments coupled to the plurality of curvature sensors to form a mesh; and

a communication device configured to communicate the output of the curvature sensors to a distant receiver.

Claim 28 – 30 (cancelled).

Claim 31 (original): A device for conducting surgery or therapy on a body,

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comprising:

means for measuring the curvature of a body;

means for locating the position of the means for measuring the curvature
of a body within a frame of reference;

means for determining the position of a tool with respect to the means for
measuring the curvature of a body; and

means for registering a volumetric image of the body to the means for
measuring the curvature of a body.